Derris.

Derris, *Adams* in Linn. Trans. ii. 67.

1. *D. sanguinea.*

Derris sanguinea, Adams in Linn. Trans. ii. 67. tab. 13. fig. 1, 2. Turt. Gmel. iv. 108. Turt. Brit. Faun. 132. Penn. Br. Zool. iv. 101.

XLVI.—*Journey through Java, descriptive of its Topography and Natural History.* By Dr. Fr. Junghuhn*.

[Continued from p. 332.]

Journey to the Merapi.

We ascended from the Sawungang towards Andong, and at a height of 3000 feet came to a district which was covered with *Saccharum Klaga* growing to a height of from 15 to 20 feet. The forests then again appeared which had already been passed lower down. Here begins a frightful wilderness: high vaulted trees, covering the whole country far and wide, rose up from the deepest clefts and pressed against the steepest acclivities: climbers and densely interwoven shrubs filled up all the interstices between the stems. One while we came to a narrow mountain ridge scarcely two feet broad, between steep disrupted masses of rock covered with trees; then we mounted up these steep acclivities, climbing from the stem of one tree to another; then, again, we found ourselves in deep, moist, rocky clefts, vaulted over by the foliage of the trees and shrubs so thickly that not a ray of the sun could penetrate to us. The clouds had settled low on the mountains, and enveloped us in their damp and cold mists, which brought with them a peculiar odour. These deep forests are formed of hundreds of species of trees, which belong to the most various families. Preeminent are the species of *Ficus*, easily distinguished by their white, tenacious, milky sap, which flows from the injured bark; and next to these, the *Magnoliaceæ* and *Urticeæ*. In the thicket which fills up the spaces between their gigantic stems, the beautiful flowers of species of *Medinella* and other *Melastomaceæ* shine forth; and *Scitamineæ* (*Amomum*, *Zingiber*, &c.) raise their luxuriant leaves to a height of 20 feet, whilst their variegated cones of blossoms only half appear above the moist ground. *Urtica*? *dichotoma*, Bl. 'Bydragen,' a small tree with beautiful leaves which on their under surface have white and parallel veins, adorns these thickets†. A little higher up occurs a beautiful social *Lycopodium*, which attains a height of scarcely three feet, and covers the moist parts of the woods, like our mosses, as a kind of coherent cushion.

* From the *Botanische Zeitung*, Sept. 5th and 12th, 1845.

† Arbor est elegans, trunco gracili, 30—40 pedes alto, cinereo, ramisque gracilibus; foliis in ambitu ramulorum collectis.—Silvulas constituit visu singulares, declivia montis Merapi ex altitudine 4000 pedum ad 6000 tegentes.—Trunci, quo magis in altum montis adscendunt, eo humiliores evadunt, denique vix 20 pedes alti, Usneis tecti, e ramis longe dependentibus.

But its beautiful green did not long refresh our eyes, for it soon disappeared, and species of oaks, especially *Qu. pruinosa*, Bl., began to predominate in the woods. These are immense trees, 100 feet high, whose branches are thickly covered up to the highest tops with succulent parasites, *Orchideæ*, mosses, *Usneæ*, and numerous other lichens. The whitish *Usneæ* hang down many feet long from the branches. In company with the oaks we find the *Areca humilis*, W., a palm with slender stems scarcely as thick as an arm, whose red bunches of fruit adorn the steep acclivities. Here were seen on every side the beautiful umbrella-shaped, palm-like foliage of the tree-ferns upon a little stem 30 feet high, which grow at this elevation most luxuriantly (*Chnoophora glauca*, Bl.).

The oaks gradually become less frequent, and another kind of tree, Kaju-Angring (a species of *Celtis*), by degrees becomes more and more predominant, and at last exclusively constitutes the woods. These are trees of a moderate height, with gray slender stems and slender branches, which are only partially clothed with scanty foliage. With these occur species of *Rubus*, whose red berries reminded us agreeably of Germany and our own Hartz forests. The mists became thicker and the cold more piercing (60° F., 12° R.), and the rocky clefts thickly overgrown with weeds became more frightful. In one of these clefts we met with a cavern (rather a fissure in the rock) in which species of *Rubus* (*R. javanicus*, Bl., *R. lineatus*, *R. moluccanus*, L.) grew most luxuriantly; we here noticed the last stems of the *Musa paradisiaca*, which up to the present time had accompanied us. The steepness of the acclivities, the rocks of which rise in steps, increased. The angring-trees became lower, and their stems more thin and slender; but the *Usneæ*, which hang down from their branches, were more frequent. Here began to appear a small fern (*Polypodium vulcanicum**), and higher up it became more numerous. It grew luxuriantly from the crevices of the boulders of rock, which, cemented by a softer earth, cover the ground†. The luxuriant climbing plants and tropical shrubs had now disappeared; but plants succeeded which reminded us more of the flora of the temperate climate of Europe, especially bushes of red-berried species of *Rubus*, and the *Hypericum javanicum*, Bl., a shrub covered with yellow blossoms.

We now arrived, all the while enveloped in thick mists, at a rocky headland overgrown with the before-mentioned ferns and with grass; here blackish gray masses of trachyte of very various sizes projected from the soil, and many little channels descended straight down the mountain's side four feet broad and four to six feet deep. It was already 3 o'clock; I doubted of being able to reach the top of the mountain that day, especially as the Javanese had lain down and lighted some fires, for which the dry leafless branches of the angring-trees yielded

* Described and figured under this name by Prof. Blume in the Flora of Java.

† It is peculiar to all the high mountains in Java, and characterizes all acclivities situated at above 5000 feet, covered with boulders of rock: I found it at a later time, just as plentiful as upon the Merapi, on the mountains in Cheeribon and in the Preangerlanden (West Java).

a useful fuel. In the whole circuit of this small headland (or less steep acclivity) the trees were barren and killed by the former action of fire. Our Kapola Gunong told me, that he had fired them on a former journey.

At a short distance eastward of this spot, one of the deep clefts in the rock, which are generally dry and only after rain form thundering torrents, descends the mountain. On the steep mountain-wall which rises on the other side of the cleft, I noticed the last tree-ferns; I also still saw here *Melastoma malabaricum*, L.,—a shrub which occurs in similar luxuriance on the sea-shore. The small stems of the angring-tree are here already very slender and narrow, hung with *Usneæ* and divided above into slender twigs, between which the transparent loose foliage expands.

The height above Djocjokarta amounts to 5231 feet; the thermometer stood at 64° F., a temperature at which the Japanese trembled and shook with cold; but after they had warmed themselves by the fire, they were merry again, to which some opium and brandy, which last they do not despise in the cold climate, contributed. They boiled some coffee, ate rice, and urged me, after I had put in order the plants I had collected, to continue our journey at once. I agreed, and all arose with renewed strength.

The angring-trees became gradually smaller, and in a short time we lost them altogether. But there still grew here small young shrubs of the *Acacia montana* (the Kamalandingan of the Japanese), for a short distance higher up, and then they also disappeared to make place for another beautiful and very peculiar vegetation, which gives to the barren rocky mountain-walls a more northern aspect. This consists in small bushes, a few feet high, which take root in the clefts of the rocks, and some of which appeared also lower down in the woods, but only isolated, whilst here they are the only plants which cover the gray rock with an uninterrupted clothing. Most prominent is a *Gnaphalium* with pale blossoms (*G. javanicum*, Bl.?), and the *Gaultheria punctata*, Bl., from whose sweet-smelling leaves the Japanese prepare an oil which fetches a high price in the market. With these are associated *Polygonum paniculatum*, Bl., *Thibaudia varingiæfolia*, Bl.*, *Hypericum javanicum*, Bl., *Rhododendron tubiflorum*, Bl., with scarlet umbelliform flowers, and several other *Ericaceæ*. *Gaultheria repens*, Bl., whose black berries my companions ate, and several species of *Lycopodium*, clothe the rocks luxuriantly, from which they often hang down in festoons; out of their clefts, filled with *Orthotrichum* and other mosses, grows plentifully the *Polypodium vulcanicum*, Bl., whilst a crust-like lichen with a yellowish thallus and reddish apothecia covers the smoother parts. Continuing to climb, we soon came to the heights of the ridge, where boulders of stone of all sizes lie strewn about, only imper-

* *Thibaudia varingiæfolia*, Bl. The normal form of the leaves is elliptico- (broad-) lanceolate. But they pass over (generally on one and the same bush) into the elongate- (narrow-) lanceolate, ovate-lanceolate, obovate, and even into the cuneiform; nor is the hairiness of the calyx more constant (*T. floribunda*, *Varingiæfolia cuneifolia*, and *mystoides*, Bl.).

fectly held together by a little earth and moss; not unfrequently they rolled away from under our feet and struck those who were climbing lower down. We were soon obliged to descend in the deep bed of the torrent itself, the rocky bottom of which is frequently so steep and smooth, that, although with naked feet, we often lost our footing and slid down for many yards. The mountain became gradually more naked, barren and steep; the little shrubs were more and more scattered and apart; and soon the ash-gray naked mountain wall lay before us, sterile and destitute of all verdure, and interrupted only by green fissures. Only *Gaultheria repens* and climbing *Lycopodia* accompanied us still higher up; the above-mentioned lichens, some mosses, and the *Polypodium vulcanicum* reach in fact to the rim of the crater.

Ascent of the Mud-Volcano Galungung.

On the flatter and smoother tract spread out between the hills and the foot of the mountain, commences a frightful jungle. Everything, as far as the eye can reach, is covered with *Saccharum Klaga*, a juncaceous species of grass, which reaches a height of fifteen feet, and the stalk of which is so thick that it is only possible to make a way through it with the greatest effort. The intermediate spaces are filled up with a species of *Equisetum*, which rises ten feet high, and in the midst of which some species of *Vanilla* and other *Orchideæ* unfold their blossoms. At the same time all the ground is soaked with moisture, so that at every moment one steps into little puddles or black channels of mud, which diffuse a mouldy smell, or into brooks and little ditches, which with a depth of several feet are often scarcely a foot wide, and which cross the jungle in all directions. These communicate with larger rivulets, which wind slowly, and often quite hidden by the jungle, through this lower tract, and are only discovered by their noise. They quickly overflow their banks, when more water falls down the mountains after a heavy rain than can flow off in a short time from the slightly inclined rush-covered soil, which moreover is shut in by some low hills in front.

An idea may be formed of the impenetrability of such a thicket, from the fact, that since yesterday more than three hundred Japanese have been engaged in cutting a small path for us, not wider than one or two feet. We here found a fresh proof of what we had already previously experienced, that such jungles in Java are much more impassable than the thickest primitive forests. At one time we were obliged to make our way along little furrows or ditches, filled with water; at another, to wade through deep rivulets covered with loose masses of rock; at another, to wade through boggy parts, which were only covered with spongy layers of klaga; again, at another time, we had to follow the path just before hewn out, where we ran the risk, from an insecure footing, of being impaled on the sharp cut-off stems of the klaga.

The little paths which had been formed by the tigers and rhinoceroses in the klaga were very serviceable to us, so that towards eleven o'clock we had passed the most wearisome and boggy portion of the thicket, and came to a more open tract, where we were most

agreeably surprised by the appearance of a European species of rush. It was *Typha angustifolia*, in appearance quite identical with the European narrow-leaved *Typha*, which grows here in luxuriant abundance between the klaga, and whose light brown heads waving to and fro reminded us forcibly of home. The Japanese, who give a particular name to every small plant, had none for this one; they had never seen it, and only a few, who lived in villages in this district, appeared to know it. How does this European plant come here upon the volcanic district which has only been formed fourteen years, and over which no traveller has since that time passed?

The ground now rose gradually steeper, became drier, and was covered with layers of loose stone and rocks, which were here and there covered with groups of young angring-trees (*Celtis montana*, J.). Tree-like *Urticeæ* also grow here, and alternate with patches of klaga, which had as yet not lost any of their luxuriance. At that part where, at the entrance to the large crater, the land rises remarkably, there commences a peculiar forest vegetation, filling the entire cavity (several miles in breadth), which gradually rises and becomes more narrow towards W.N.W. It consists of young trees, seldom exceeding thirty feet in height, of the families of *Urticeæ*, *Artocarpeæ*, *Magnoliaceæ*, and others, which occasionally alternate with bamboos, forming a leafy vaulted shade. Numerous tree-ferns, thirty feet high, are scattered among them, and *Aroideæ*, *Musaceæ* and *Scitamineæ* blossom in their shade. But there are still many patches of klaga which interrupt the continuous extent of the little woods, and reach high up into the crater. Thus the thicket is composed of young trees, shrubs and species of reeds, which fill up the hilly uneven ground of the crater, intersected with numerous clefts, and only become thinner and more scattered beneath a hill which runs like a wall straight across the highest point of the crater.

It is interesting to see what giant steps vegetation has made in the short space of fourteen years. We find this new volcanic tract, from the plains at Tassik-malayo up to the hollow of the crater, a height of 3700 feet, overgrown with the most luxuriant and dense vegetation, formed of *Typha angustifolia* (?), *Saccharum Klaga*, and a species of *Equisetum* in the lower region, but higher up of tree-ferns and trees of the families of *Urticeæ* and *Artocarpeæ*, interlaced with numerous *Scitamineæ* (*Elettaria*, *Amomum*, &c.) and *Lianæ*. Some trees have already attained a height of fifty feet. This luxuriance is the more striking, when we compare other mountains; for example the Merapi, the higher parts of which (although more than fourteen years have elapsed since its last eruption) are not yet clothed with vegetation. But these tracts lie at a greater height than 5000 feet, whilst those (of the Galungung) belong to the warmer region, where nature is more luxuriant and active; these consist of debris of bare rocks, covered with lapilli of trachyte and pumice-stone, whilst those of the Galungung were flooded with a fruitful blackish mud.

In the rhinoceros-paths mentioned above, the Japanese are accustomed to kill these animals by fixing in the earth sickle-shaped knives, so that the belly of the animal, sliding along the ground, is ripped up by them when it passes that way.